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## DELTA STEWARDSHIP COUNCIL

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June 12, 2012

Chair  
Phil Isenberg

Members  
Randy Fiorini  
Gloria Gray  
Patrick Johnston  
Hank Nordhoff  
Don Nottoli  
Felicia Marcus

Mr. Brian Nissen  
Bella Machines  
21457 SW 95<sup>th</sup> Court  
Tualatin, OR 97062

Executive Officer  
P. Joseph Grindstaff

Dear Mr. Nissen:

Thank you for your June 1, 2012 letter asking for my input on your "... proposal for a new desalination plant located in Los Angeles", and asking for general advice on how to implement your project.

I have taken the liberty of posting your letter on our web site, along with a copy of this reply.

Although we are happy to receive information about new techniques that might make California's water supply more affordable and/or efficient, the Council neither approves, sponsors or finances such projects. Typically, the Department of Water Resources would be the lead agency for any state involvement in water recycling project.

I do want to note that California's diverse water 'system' is a bewildering mix of federal, state and local projects. Overwhelmingly, the annual spending for water and wastewater projects in California is through local water districts, not the state or the federal government.

Your letter described your project as being based in Los Angeles, and one of the many water districts in that county might be interested in your project.

For your information, the Council has been approached several times by businesses seeking Council ratification of one of their products, or mention of their products in our Delta Plan.

We have rejected such requests. It would be inappropriate for us to sponsor, endorse, or mention individual commercial water products or services in the Delta Plan.

Finally, Mr. Nissen, thank you again for your thoughts. Good luck with your project.

Sincerely,

Phillip Isenberg, Chair  
Delta Stewardship Council

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*"Coequal goals" means the two goals of providing a more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem. The coequal goals shall be achieved in a manner that protects and enhances the unique cultural, recreational, natural resource, and agricultural values of the Delta as an evolving place."*

– CA Water Code §85054



# Bella Machines

21457 SW 95th Court, Tualatin, Oregon 97062  
phone: 503-486-5757

June 1, 2012

Phil Isenberg  
Chair  
Delta Stewardship Council  
980 Ninth Street, Suite 1500  
Sacramento, CA 95814

RECEIVED  
DELTA COUNCIL  
MAILROOM  
2012 JUN -4 PM 1:41

Dear Mr. Isenberg,

My name is Brian Nissen and I have been working on a project concept for some time now. I have developed and patented a pumping system that would be ideal for California. My expertise is in water flow systems. Where I need help is in understanding the broader issues of implementing a large scale project of this nature.

I would like to share information about this pumping system and get your feedback on:

- the feasibility of such a proposal,
- how it compares to current water generation systems, and
- what barriers might exist to its' implementation, and how they might be overcome.

Specifically, I would like to get your input on my proposal for a new desalination plant located in Los Angeles. This plant would be powered by water from the LA Aqueduct, but coming from a much stronger, more durable pipeline. I call this proposed pipeline the LA Super Conduit. Building the LA Super Conduit and an associated LA Desalination Plant would be a major public works project. It would provide a tremendous amount of new jobs and a new water source, in a time when both are needed.

I have attached a draft of my proposal. I would appreciate your review and critique. I can be reached at [briannissen@rocketmail.com](mailto:briannissen@rocketmail.com) or by phone at 503-486-5757. Thank you for your time.

Best regards,

Brian Nissen



*DRAFT PROPOSAL*

# The Los Angeles Desalination Project



Author: Brian Nissen

Company: Bella Machines

# The Los Angeles Desalination Project

## CALIFORNIA WATER

The California water crisis has been a problem that has been percolating for decades. With two-thirds of California's population living in Southern California, but two-thirds of California's annual precipitation falling in Northern California, finding reliable water sources is a constant struggle. As troublesome as things have been for California in the past, conditions are only expected to worsen. Water exports from the Delta to Southern California have been limited to protect fish, and the population of Southern California is projected to increase dramatically. California's protracted water wars have pitted farmers against municipalities.

Here at Bella Machines, we have developed and patented a special water system to harness the power of falling water and convert it directly into power for pumping. This new system is called Transformed Hydraulic Power. Transformed Hydraulic Power is a different way of thinking about hydraulic power because its end purpose is to pump water, not to generate electricity.

Water has an extremely high density. This fact enables it to have the capacity to generate great amounts of power. Likewise, pumping water consumes great amounts of power. Transformed Hydraulic Power takes the power from falling water and uses it directly to pump water from a second source, like the sea. By eliminating electricity as a conversion step, a greater Overall System Efficiency can be achieved.

The ideal location for implementing a massive desalination project would be Los Angeles. This would create a local, large water supply which would ease tensions over water in California and will benefit future generations. Despite the escalation of the California water crisis, there is a solution. Most importantly, it is a renewable energy solution.

## WHY DESALINATION?

A federal ruling in 2007 limited water exports from the Delta to Southern California, in order to protect fish. As a result, Southern California must look elsewhere for its growing water demand. Barry Nelson, of the Natural Resources Defense Council, has advised that new dams and reservoirs won't generate much water, since 1,200 major dams already hold back most of California's rivers.<sup>1</sup> With limited options for new water, desalination has become a necessity. Peter H. Gleick, president of the Pacific Institute, states, "...desalination's appeal is growing as other sources of water disappear and the price gap closes."<sup>2</sup> Using Transformed Hydraulic Power will dramatically reduce the power consumption and cost normally associated with desalination because it is a power plant and a water plant together.

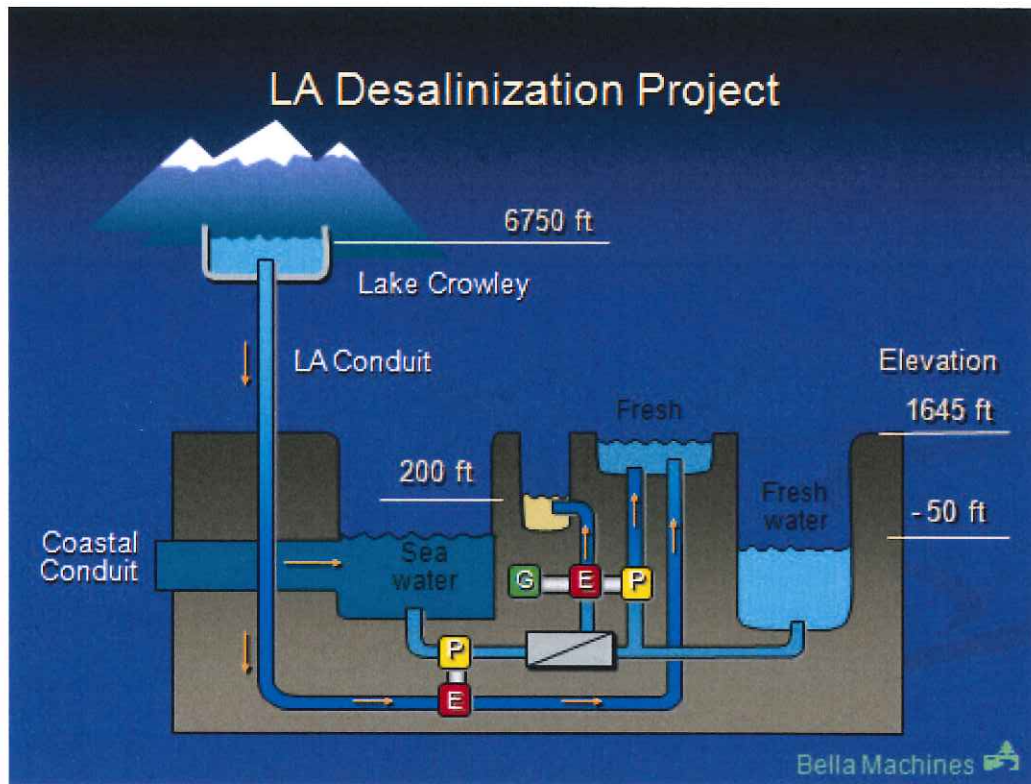
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<sup>1</sup> Michels, Spencer. "Water Woes" NewsHour with Jim Lehrer. 4 July 2008.

<sup>2</sup> Gleick, Peter H. "Ask the Experts." Scientific American Oct. 2008: 104.



## WHAT IS TRANSFORMED HYDRAULIC POWER?



**G = Generator      E = Engine      P = Pump**

The above diagram is a rendering of what the LA system might look like. However, the elevations, flows and locations are subject to change pending a survey being completed of the LA Aqueduct. This diagram is designed to give an overview of how the system could work. The power source is the mountain reservoir at a high elevation that connects to the LA Conduit. This conduit travels down to the city and the desalination plant located underground. One of the benefits of the conduit being located underground is that it avoids the risks of terrorist threats and it avoids right-of-way issues. Beach wells will be dug and covered, then connected to the Coastal Conduit. The Coastal Conduit will convey sea water by gravity to the desalination plant. The desalination plant is not

located on the coastline where property values are extremely high and public recreation areas are valued. Sylmar, CA is the city that has been chosen to use in this example.

The heart of the Transformed Hydraulic Power system is the Water Engine–Pump. Two of these are utilized. The Membrane Engine–Pump, which is located at the bottom of the diagram, is the main work horse of the system. It takes the power of falling water and drives the high pressure pump. The sea water is forced through the membrane. Two liquids exit the membrane; the brine and the fresh water. The brine is still at high pressure so it is used to power the Recovery Engine–Pump. The task of this pump is to lift the newly generated fresh water to the surface.

## THE POWER BENEFITS

The Power that can be derived from falling water is equal to the Flow times the Fall. The total Fall from the Owens Valley to LA is over 5,000 ft. There is tremendous potential to expand this energy resource. The LA Aqueduct was built 100 years ago and has very few hydroelectric plants. By replacing the LA Aqueduct with the LA Conduit, the power of falling water can be fully utilized to pump sea water through membranes. Although some hydroelectric plants along the LA Aqueduct will see a loss in power production, the power losses will be outweighed by substantial power gains. The power gains include:

- Power savings by reducing demand on the California Aqueduct Pumps that convey water from the Delta to Southern California. The A.D. Edmonston Pumping Plant is the largest Lift in the world and is tasked with pumping water over the Tehachapi Mountains. Every gallon of water that is generated in LA is one less gallon that must be pumped out of the Central Valley.
- Greater generating capacity from the new LA Desalination Plant compared to the loss of generating capacity from the LA Aqueduct. The LA Conduit will have a

continuous and unbroken Fall unlike the LA Aqueduct with its sporadic hydroelectric plants along its length.

- Greater Overall System Efficiency, by cutting electricity out of the loop and utilizing direct (water-to-water) energy conversion.

## THE WATER BENEFITS

Another benefit of Transformed Hydraulic Power is that it multiplies the usable water leaving the system. Even after filtering sea water at a sizable pressure drop and after rejecting brine water from the new LA Desalination Plant, it is still conceivable that the filtered sea water flow may be equal to the LA Conduit flow. The LA Aqueduct historically serves about 50% of LA's water needs. Assuming this water is transferred to the LA Conduit, this new system could supply the other 50% of LA's water by using the sea! This would be a major achievement.



## LA DESALINATION PROJECT BENEFITS

### Jobs

There may be debate about how many jobs have been lost since the Recession started. There also may be debate about how many have been regained. However, there is no doubt that more jobs are needed in the United States. This project would provide those jobs. It would be a home-grown U.S. project, providing jobs for Americans.

### Water

Water is not a luxury. It is a necessity. It is needed for agriculture and for personal use. Southern California population growth over the next decade will only further the conflict between agriculture and municipal water demand. If Southern California can become less dependent on the Delta, then more water can stay in the Central Valley for farming. California is the nation's number one farm state. The economic impact of farming affects the whole state, and surrounding states as well. Food security and food inflation are important issues that impact every American. In the future, water needs will compete with energy needs for our attention. The LA Desalination Project will address both needs.

### Environment

When looking at any new project, one has to take into account the environmental impact. Fortunately, Transformed Hydraulic Power has a positive environmental impact.

- It is fish friendly. There is no way for fish to enter system and be harmed.
- It protects the California Delta by reducing water demand. Further, it provides a back-up plan for Southern California water supply, in case the Delta experiences any problems.

- It is a renewable energy source that produces no Global Warming Gas emissions and has no ongoing fuel costs.
- The power supply requires a high elevation reservoir. This will also provide a counter measure to loss of snowpack in the mountains caused by Global Warming. Snow is nature's water storage system. It regulates water flow throughout the year. Without it, other measures must be taken to increase storage.

## NEXT STEPS

Transformed Hydraulic Power is intended for large scale public utility and can play an integral role in solving California's water crisis and creating jobs in America. In order to move forward, the next step is to obtain feedback from those knowledgeable about:

- Water supply issues,
- Renewable energy,
- Creating jobs in America, and
- Environmental restoration.

This is where your advice is sought. I would appreciate any feedback you would be willing to share. I can be reached by e-mail at [briannissen@rocketmail.com](mailto:briannissen@rocketmail.com) or, by phone, at 503-486-5757. I look forward to hearing your thoughts.